

Part IV. Plant Assessment Form

For use with "Criteria for Categorizing Invasive Non-Native Plants that Threaten Colorado's Wildlands and Agriculture"
By the Colorado Noxious Weed Advisory Committee

Electronic version: December 4, 2008

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Galium verum L.
Synonyms:	
Common names:	Yellow Bedstraw, Yellow Spring Bedstraw, Wirtgen's Bedstraw, Lady's Bedstraw
Evaluation date (mm/dd/yy):	4-20-10
Evaluator #1 Name/Title:	Michael Ostlie, Graduate Research Assistant
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Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

enter text here

Table 2. Criteria, Section, and Overall Scores

<u>1.1</u>	Impact on abiotic ecosystem processes	D	No Information	Impact <i>Enter four characters from Q1.1-1.4 below:</i> DBDD <i>Using matrix, determine score and enter below:</i> C	Wildlands Plant Score <i>Using matrix, determine Overall Score and Alert Status from the first, second, and third section scores and enter below:</i> Limited No Alert	
<u>1.2</u>	Impact on plant community	B	Rev'd, Sci. Pub'n			
<u>1.3</u>	Impact on higher trophic levels	D	Rev'd, Sci. Pub'n			
<u>1.4</u>	Impact on genetic integrity	D	Other Pub. Mat'l			
<u>2.1</u>	Role of anthropogenic and natural disturbance	A (3 pts)	Rev'd, Sci. Pub'n	Invasiveness <i>Enter the sum total of all points for Q2.1-2.7 below:</i> 14 <i>Use matrix to determine score and enter below:</i> B		
<u>2.2</u>	Local rate of spread with no management	C (1 pt)	Other Pub. Mat'l			
<u>2.3</u>	Recent trend in total area infested within state	C (1 pt)	Other Pub. Mat'l			
<u>2.4</u>	Innate reproductive potential <u>Wksht A</u>	A (3 pts)	Rev'd, Sci. Pub'n			
<u>2.5</u>	Potential for human-caused dispersal	B (2 pts)	Rev'd, Sci. Pub'n			
<u>2.6</u>	Potential for natural long-distance dispersal	B (2 pts)	Rev'd, Sci. Pub'n			
<u>2.7</u>	Other regions invaded	B (2 pts)	Rev'd, Sci. Pub'n			
<u>3.1</u>	Ecological amplitude/Range	B	Other Pub. Mat'l	Distribution <i>Using matrix, determine score and enter below:</i> C		
<u>3.2</u>	Distribution/Peak frequency <u>Wrksht B</u>	D	Other Pub. Mat'l			

<u>4.1</u>	Poisonous to livestock	D (0 pts)	Rev'd, Sci. Pub'n
<u>4.2</u>	Detrimental to economic crops	D (0 pts)	Rev'd, Sci. Pub'n
<u>4.3</u>	Detrimental to management of agricultural system, rangeland and pasture	C (1 pt)	Rev'd, Sci. Pub'n
<u>4.4</u>	Human impacts <u>Wrksht C</u>	C (1 pt)	Rev'd, Sci. Pub'n

Agricultural / Human Impact

Enter the sum total of all points for Q4.1-4.4 below:

2

Use matrix to determine score and enter below:

C

Agricultural Plant Score

Using matrix, determine Overall Score and Alert Status from the second, third and fourth section scores and enter below:

Moderate

No Alert

Table 3. Documentation

Question 1.1 Impact on abiotic ecosystem processes	D No Information back
Identify ecosystem processes impacted: none found	
Rationale:	
Sources of information:	
Question 1.2 Impact on plant community composition, structure, and interactions	B Rev'd, Sci. Pub'n back
Identify type of impact or alteration: This species can migrate to established sites and out-compete native species.	
Rationale: This plant prefers growth in established regions to open areas (1). It also prefers to invade grass/meadow land (1) and can invade abandoned land (2).	
Sources of information: 1. Tofts, Richard and Jonathan Silvertown. 2002. Community Assembly from the Local Species Pool: An Experimental Study Using Congeneric Species Pairs. Journal of Ecology. 90:385-393. 2. Stranska, M. 2004. Successional dynamics of Cynosurus pasture after abandonment in Podkrkonosi. Plant Soil Environment. 50:364-370.	
Question 1.3 Impact on higher trophic levels	D Rev'd, Sci. Pub'n back
Identify type of impact or alteration: This plant can support slugs, larvae of many butterfly species, as well as large herbivores.	
Rationale: This plant appears to have no negative impact on higher tropic levels.	
Sources of information: 1. Hegland, S.J., J.A. Grytnes, and O. Totland. 2009. The Relative Importance of positive and negative interactions for pollinator attraction in a plant community. Ecological Restoration. 24:929-936.	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: none found	
Rationale: Hybridization is unlikely due to different chromosome numbers/ploidy levels of other related species.	
Sources of information: Hauser, Edward J.P. 1964. The Rubiaceae of Ohio. The Ohio Journal of Science. 64:27-35.	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Rev'd, Sci. Pub'n back
Describe role of disturbance: Disturbance is not required for the plant to invade an area. But will excel	

comparatively in poor growing conditions.		
Rationale: This species prefers growth in established sites, versus open areas (1). It also prefers poorer soils including dry/sandy soils, nitrogen poor, alkaline and calcareous soils (2,3).		
Sources of information: 1. Tofts, Richard and Jonathan Silvertown. 2002. Community Assembly from the Local Species Pool: An Experimental Study Using Congeneric Species Pairs. Journal of Ecology. 90:385-393. 2. Houston J. 2008. Management of Natura 2000 Habitats. 2130 Fixed coastal dunes with herbaceous vegetation. European Commission. 3. Obratov-Petkovic, D., I. Popovic, S. Belanovic, and R. Kadovic. 2006. Ecobiological study of medicinal plants in some regions of Serbia. Plant Soil Environment. 52:459-467.		
Question 2.2 Local rate of spread with no management	C	Other Pub. Mat'l back
Describe rate of spread: Relatively slow		
Rationale: This plant is a perennial but can reproduce clonally, increasing the invasive potential under ideal growing conditions, however, no significant increases have been noted yet in Colorado.		
Sources of information: 1. United States Department of Agriculture Plant Profile. 4-30-10. http://plants.usda.gov 2. University of Colorado Herbarium. Research/Botany/Databases/search.php. 4-30-10.		
Question 2.3 Recent trend in total area infested within state	C	Other Pub. Mat'l back
Describe trend: Slow.		
Rationale: The plant has been present but in low abundance in Colorado.		
Sources of information: 1. United States Department of Agriculture Plant Profile. 4-30-10. http://plants.usda.gov 2. University of Colorado Herbarium. Research/Botany/Databases/search.php. 4-30-10.		
Question 2.4 Innate reproductive potential	A	Rev'd, Sci. Pub'n back
Describe key reproductive characteristics: The plant can spread via seed produced in the fall. Plant fragmentation and branch rooting can also occur creating multiple clonal plants.		
Rationale: spread is most rapid through vegetative reproduction (2).		
Sources of information: 1. Plants for a Future. http://www.pfaf.org . 4-30-10. 2. Halassy, M., G. Campetella, R. Canullo, and L. Mucina. 2005. Patterns of functional clonal traits and clonal growth modes in contrasting grasslands in the central Apennines, Italy. Journal of Vegetation Science. 16:29-36. 3. Tofts, Richard and Jonathan Silvertown. 2002. Community Assembly from the Local Species Pool: An		

Experimental Study Using Congeneric Species Pairs. Journal of Ecology. 90:385-393.	
Question 2.5 Potential for human-caused dispersal	B Rev'd, Sci. Pub'n back
Identify dispersal mechanisms: Movement of propagules after fragmentation via human traffic (walking, vehicles, etc). This plant can also be purchased as an ornamental and spread via seeds/planting.	
Rationale: The plant has the ability to root from nodes along its stem. Thus, the plant can be fragmented into multiple plants is the stem is severed.	
Sources of information: 1..Halassy, M., G. Campetella, R. Canullo, and L. Mucina. 2005. Patterns of functional clonal traits and clonal growth modes in contrasting grasslands in the central Apennines, Italy. Journal of Vegetation Science. 16:29-36. 2. Tofts, Richard and Jonathan Silvertown. 2002. Community Assembly from the Local Species Pool: An Experimental Study Using Congeneric Species Pairs. Journal of Ecology. 90:385-393.	
Question 2.6 Potential for natural long-distance dispersal	B Rev'd, Sci. Pub'n back
Identify dispersal mechanisms: This plant produces seeds annually, but is not the primary method of propagation.	
Rationale: The plant spread mainly through clonal propagation. Although germination through seeds is readily achieved, leaving the a risk for long distance dispersal under certain conditions.	
Sources of information: 1..Halassy, M., G. Campetella, R. Canullo, and L. Mucina. 2005. Patterns of functional clonal traits and clonal growth modes in contrasting grasslands in the central Apennines, Italy. Journal of Vegetation Science. 16:29-36. 2. Tofts, Richard and Jonathan Silvertown. 2002. Community Assembly from the Local Species Pool: An Experimental Study Using Congeneric Species Pairs. Journal of Ecology. 90:385-393. 3. Cosyns, E., S. Claerbout, I. Lamoot, and M. Hoffmann. 2005. Endozoochorous seed dispersal by cattle and horse in a spatially heterogenous landscape. Plant Ecology. 178:146-162.	
Question 2.7 Other regions invaded	B Rev'd, Sci. Pub'n back
Identify other regions: This plant is native in much of Eurasia (1), but has been found in many areas of the upper United States and Canada (2).	
Rationale: This species has the potential to invade grassland areas (1,3), but has not yet been documented as such in Colorado (4).	
Sources of information: 1. Vandenberg, L., H. Tomassen, J. Roelofs, and R. Bobbink. 2005. Effects of Nitrogen Enrichment on Coastal Dune Grassland: A Mesocosm Study. Environmental Pollution. 138:77-85. 2. United States Department of Agriculture Plant Profile. 4-30-10. http://plants.usda.gov 3. Tofts, Richard and Jonathan Silvertown. 2002. Community Assembly from the Local Species Pool: An	

Experimental Study Using Congeneric Species Pairs. Journal of Ecology. 90:385-393.	
4. University of Colorado Herbarium. Research/Botany/Databases/search.php. 4-30-10.	
Question 3.1 Ecological amplitude/Range	B Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: This species can invade numerous habitats, and has been documented in 3 major ecological types in Colorado, it could potentially exist in other short grass areas of the state as well.	
Rationale: The species has been documented in 3 major types, but it does not invade them all in Colorado.	
Sources of information: 1. University of Colorado Herbarium. Research/Botany/Databases/search.php. 4-30-10.	
Question 3.2 Distribution/Peak frequency	D Other Pub. Mat'l back
Describe distribution: The species hasn't appeared in dense stands yet in Colorado.	
Rationale: Although the species can invade various ecosystems, the distribution in Colorado is sparse according to documented accounts.	
Sources of information: 1. University of Colorado Herbarium. Research/Botany/Databases/search.php. 4-30-10.	
Question 4.1 Poisonous to Livestock	D Rev'd, Sci. Pub'n back
Describe impacts in terms of high probability of death, long-term health impacts, or short-term health impacts: The plant contains low levels of coumarin but does not appear to be harmful to livestock.	
Rationale: This plant is often grazed in areas where the plant is native.	
Sources of information: 1. Tofts, Richard and Jonathan Silvertown. 2002. Community Assembly from the Local Species Pool: An Experimental Study Using Congeneric Species Pairs. Journal of Ecology. 90:385-393. 2. Pykala, J. 2005. Plant Species Responses to Cattle Grazing in Mesic Semi-natural Grassland. Agriculture, Ecosystems, and Environment. 108:109-117.	
Question 4.2 Detrimental to Economic Crops	D Rev'd, Sci. Pub'n back
Describe impacts to all aspects of cropping systems (see guidelines):	
Rationale: Based on its growth habit, this plant will not likely invade cropland on a large scale.	
Sources of information: 1..Halassy, M., G. Campetella, R. Canullo, and L. Mucina. 2005. Patterns of functional clonal traits and clonal growth modes in contrasting grasslands in the central Apennines, Italy. Journal of	

Vegetation Science. 16:29-36.	
2. Tofts, Richard and Jonathan Silvertown. 2002. Community Assembly from the Local Species Pool: An Experimental Study Using Congeneric Species Pairs. Journal of Ecology. 90:385-393.	
Question 4.3 Detrimental to Mgmt of Agricultural System, Rangeland and Pasture C Rev'd, Sci. Pub'n back	
Describe impacts to water diversion systems, increased water use, reduced forage for livestock: This plant is palatable. However, it has the potential to invade range/pasture land, displacing more desirable species.	
Rationale: This plant is grazed where the it is native can can tolerate stresses. However, it may not be the most desirable species for a given area.	
Sources of information: 1. Tofts, Richard and Jonathan Silvertown. 2002. Community Assembly from the Local Species Pool: An Experimental Study Using Congeneric Species Pairs. Journal of Ecology. 90:385-393. 2. Cosyns, E., S. Claerbout, I. Lamoot, and M. Hoffmann. 2005. Endozoochorous seed dispersal by cattle and horse in a spatially heterogenous landscape. Plant Ecology. 178:146-162.	
Question 4.4 Human Health Impacts C Rev'd, Sci. Pub'n back	
Describe key human impacts such as; irritants, property values, recreational values, and industry impacts: This plant has medicinal value and has several edible parts, but doesn't appear to have health impacts.	
Rationale:	
Sources of information: Demirezer, L., F. Gurbuz, Z. Guvenalp, K. Storch, and A. Zeeck. 2006. Iridoids, Flavonoids, and Monoterpene Glycosides from Galium verum subsp. verum. Turkish Journal of Chemistry. 30:525-534.	

Worksheet A

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Reaches reproductive maturity in 2 years or less	Yes: 1 pt
Dense infestations produce >1,000 viable seed per square meter	No: 0 pts
Populations of this species produce seeds every year.	Yes: 1 pt
Seed production sustained over 3 or more months within a population annually	Yes: 1 pt
Seeds remain viable in soil for three or more years	Unknown: 0 pts
Viable seed produced with <i>both</i> self-pollination and cross-pollination	No: 0 pt
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	Yes: 1 pt
Fragments easily and fragments can become established elsewhere	Yes: 2 pts
Resprouts readily when cut, grazed, or burned	Yes: 1 pt
Total Pts 1 unknown	

	A (6+ pts)
Note any related traits: enter text here	

Worksheet B - Colorado Ecological Types and Land Use

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Major Ecological and Land Use Types	Minor Ecological and Land Use Types	Code*
Freshwater and Aquatic Systems	lakes, ponds, reservoirs	score
	rivers, streams, canals	score
Riparian and wetlands	Riparian forest	score
	Riparian shrublands	score
	Wet meadows	score
Grasslands	Shortgrass prairie	score
	Tallgrass prairie	score
	Sandsage prairie	score
	Montane meadows	score
Irrigated Agriculture	Hay meadows	D. present
	Irrigated crops (alfalfa, corn, sugar beets)	score
Dryland Agriculture	Dryland crops (wheat, corn, millet, dryland grass hay, sunflowers, mustard for biodiesel)	D. present
Developed Lands	Urban, exurban, industrial	D. present
Arid Shrublands	Sagebrush shrublands	score
	Foothills shrublands	score
	Gambel oak shrublands	score
Woodlands	Pinyon - juniper	score
	Ponderosa pine	score
	Limber pine	score
Forest	Lodgepole pine	score
	Spruce-fir	score
Alpine	Boulder and rock fields	score
	Dwarf shrublands	score
	Tundra	score
Barrens (lower elevation)	Dunes	score
	Rock outcrops	score
	Canyonlands	score

* A. means >50% of type occurrences are invaded; B means >20% to 50%; C. means >5% to 20%; D. means present but ≤5%; U. means unknown (unable to estimate percentage of occurrences invaded).

Worksheet C – Human Impacts

Human health impacts; irritants (sap), spines, poisonous, and/or smoke impacts	Yes: 1 pt
Property values are decreased due to increased risk of fire	No: 0 pts
Decreased property value due to moderate to heavy infestations	No: 0 pts
Decreased land value for recreational use; boating, fishing, camping, etc.	No: 0 pts
Impact of listing detrimental to industry; agriculture, horticulture, nursery, and/or seed	No: 0 pt
	Total Pts Total Unknowns
	C (1-2)
Note any related traits: enter text here	